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मानक

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Mazdoor Kisan Shakti Sangathan

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“Step Out From the Old to the New”

IS 3099-1 and 2 (1992): Microscopes - Slips and slides:
Specification: Part 1 Microscope slips, Part 2: Microscope
slides [PGD 22: Educational Instruments and Equipment]



“ज्ञान से एक नये भारत का निर्माण”

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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

सूक्ष्मदर्शी यंत्र — स्लिप और स्लाइड — विशिष्ट

भाग 1 सूक्ष्मदर्शी यंत्र स्लिप

भाग 2 सूक्ष्मदर्शी यंत्र स्लाइड

(पहला पुनरीक्षण)

Indian Standard

**MICROSCOPES — SLIPS AND SLIDES —
SPECIFICATION**

PART 1 MICROSCOPE SLIPS

PART 2 MICROSCOPE SLIDES

(First Revision)

UDC 535.827.1

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

August 1992

Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

This standard was first issued in 1965 and in view of the experience gained during the period and other development taken place at national and international level, it has been decided to issue this revision.

This standard deals with the requirements of microscope slides and cover slips made from glass. The requirements of the various types are covered in two parts as given below:

Part 1 Microscope slips

Part 2 Microscope slides

Transparent vitreous silica cover slips and slides under Section 2 and 4 of IS 3099 : 1965 have been deleted. It has been gathered from various sources that this type of slides are not in vogue. A standard for them may not be required although there might be stray uses.

The slides and cover slips dealt with in this standard are for general purpose use in the laboratories. It should, however, be noted that the tolerances on the thickness and cover slips specified in this standard is suitable for general purposes only. With this view in consideration a note of cautionary nature as a guideline is given but it does not form part of the standard. For research and other special purposes, cover slips having a much finer tolerance may have to be used or recourse has to be made to more elaborate types of microscopes where a compensating device for the thickness of cover slips is incorporated.

In the formulation of this standard, due weightage has been given to the need for international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices followed in the field in this country. Assistance has also been derived from the following:

ISO 8037-1 : 1986 Optics and optical instruments — Microscope — Part 1 : Dimensions, optical properties and marking. International Organization for Standardization (ISO).

ISO 8255-1 : 1986 Optics and optical instruments — Microscopes — Part 1 : Dimensional tolerances, thickness and optical properties. International Organization for Standardization (ISO).

BS 3836 : Part 1 : 1964 Microscope cover slips and slides, issued by British Standards Institution (BSI).

AMENDMENT NO. 1 FEBRUARY 1994
TO
IS 3099 (Part 1 and 2) : 1992 MICROSCOPES — SLIPS
AND SLIDES — SPECIFICATION

(*Page 1, clause 2.1, line 3*) — Substitute ' $n_e 1.5255 \pm 0.0015$ ' for ' $n_e 1.5225 \pm 0.0015$ '.

(LMD 20)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 SEPTEMBER 1999
TO
IS 3099 (PARTS 1 AND 2) : 1992 MICROSCOPES —
SLIPS AND SLIDES — SPECIFICATION

PART 1 MICROSCOPE SLIPS

PART 2 MICROSCOPE SLIDES

(First Revision)

(Page 1, clause 5) — Substitute the following for the existing clause:

'5 SURFACE FINISH AND EDGE QUALITY

5.1 Surface Finish

The surface of the cover slips shall be fire polished (or equivalent) and shall be free from pits, nicks, scratches and other surface irregularities when viewed at 5 x magnification.

5.2 Edge Quality

Edges of the cover slips shall be free from sharp edges and chippings.'

(Page 2, clause 7) — Substitute the following for the existing clause:

'7 PACKAGING

Cover slips shall be supplied in cartons of multiples of 50 pieces or of 100 pieces. All the slips in the carton shall preferably be of same size so as to prevent damage during transit or storage due to surface abrasion or action likely to cause impairment of the transmitting surface. Packaging materials shall be free from chemicals that may cause corrosion of the surfaces.'

(Page 4, clause 9.2) — Substitute the following for the existing clause:

9.2 Microscope slides and cover slips shall be packed in such a way that no damage will be incurred during transport or storage by surface abrasion or other causes likely to impair the transmitting surface. Packaging materials shall be free from chemicals that would cause corrosion of the surfaces.

Amend No. 2 to IS 3099 (Parts 1 and 2) : 1992

For tropical conditions, microscopes slides shall be packed in a way that will substantially exclude moisture so that no attack takes place on the surface of the slides.

NOTE — For example, a suitable method might be interleaving with neutral tissue paper, or incorporating a desiccant in the box prior to seal with a impervious wrapping.'

(LM 20)

AMENDMENT NO. 4 AUGUST 2008
TO
IS 3099 (PARTS 1 AND 2) : 1992 MICROSCOPES —
SLIPS AND SLIDES — SPECIFICATION

PART 1 MICROSCOPE SLIPS

PART 2 MICROSCOPE SLIDES

(First Revision)

(Page 1, clause 3.1) — Substitute following for the existing:

‘3.1 Thickness

Cover slips shall conform to the following thickness ranges:

No. 1 (General purpose) : $0.17 \begin{smallmatrix} 0 \\ -0.04 \end{smallmatrix}$ mm

No. 1-H (High performance) : $0.17 \begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ mm

NOTES

1 Microscope manufacturers, for purposes of optical design, use 0.17 mm as the combined thickness of cover slips and mounting medium, measured from the top surface of the cover slips to the top surface of the specimen being observed.

2 In addition to the above No. 1 and No. 1-H cover slips, other thicknesses are available, such as $1\frac{1}{2}$ ($0.17 \begin{smallmatrix} +0.02 \\ -0.01 \end{smallmatrix}$ mm) and No. 2 ($0.17 \begin{smallmatrix} +0.08 \\ -0 \end{smallmatrix}$ mm) which may be used for some purposes.

Highest optical quality, particularly with large aperture objectives, may not be obtained with these thicknesses (Note 2 is only of a cautionary nature, but does not form part of the standard).’

(Page 3, clause 3.1) — Substitute following for the existing:

‘3.1 Thickness

The thickness for microscope slides shall be $1.1 \begin{smallmatrix} +0.1 \\ -0.2 \end{smallmatrix}$

NOTE —Thicker and thinner slides are available. Highest optical quality, particularly with large aperture condensers, may not be obtained with these thicknesses.’

(PG 22)

**AMENDMENT NO. 3 MARCH 2002
TO
IS 3099 (PARTS 1 AND 2) : 1992 MICROSCOPES —
SLIPS AND SLIDES — SPECIFICATION**

PART 1 MICROSCOPE SLIPS

PART 2 MICROSCOPE SLIDES

(First Revision)

*(Page 1, clause 2.1, line 3, read with Amendment No. 1, February 1994) —
Substitute 'n_e 1.525 ± 0.001' for 'n_e 1.525 5 ± 0.001 5'.*

(ME 31)

Reprography Unit, BIS, New Delhi, India

Indian Standard

MICROSCOPES — SLIPS AND SLIDES — SPECIFICATION

PART 1 MICROSCOPE SLIPS

(First Revision)

1 SCOPE

This standard (Part 1) covers the requirements of microscope cover slips for microscopes slides and specifies the requirements for dimensional tolerances, thickness and optical properties for microscope cover slips used for transmitted light microscopy in the visible spectral range.

2 MATERIAL

The material for cover slips shall be transparent, optically homogeneous and colourless glass.

2.1 Optical Properties

Cover slip shall have the following optical properties:

Refractive index n_e $1.522\ 5 \pm 0.001\ 5$

NOTE — The principal refractive index, n_e , is the refractive index of light at the green mercury e-line ($\lambda_e = 546.07\ \text{nm}$). This wavelength is close to the maximum sensitivity of the eye and has been used as the principal wavelength of optical computation for some time.

3 DIMENSIONS

The preferred dimensions for cover slips shall be as given in the Table 1. By prior agreement, cover slips having dimensions other than those specified in this table may be supplied with reference to this standard, but the specified thickness should be maintained.

3.1 Thickness

The thickness for cover slips shall be any of the following as specified by the purchaser:

- a) 0.08 mm to 0.13 mm
- b) 0.13 mm to 0.17 mm

NOTES

1 The permissible deviation for the thickness of cover slips shall be $\pm 0.015\ \text{mm}$.

2 These are general purpose cover slips. Microscope manufacturers for the purpose of optical design use 0.17 as the combined thickness of cover slips and mounting medium, measured from the top surface of cover glass to the top surface of the specimen being observed. Highest optical quality particularly with large aperture may not be obtained with these thicknesses. (This note is of cautionary nature and does not form part of this standard.)

4 VISIBLE SEED

The number of cover slips containing seed visible at $5\times$ magnification shall not exceed two percent per package.

5 SURFACE FINISH

The surface of cover slips shall be fire polished (or equivalent) and shall be free from pits, nicks, scratches and other surface irregularities when viewed at $5\times$ magnification.

**Table 1 Preferred Dimensions for Glass
Cover Slips**
(Clause 3)

All dimensions in millimetres.		
Rectangular	Square	Circular (Diameter)
22×25	18×18	16
22×30	22×22	19
22×40	24×24	22
22×50	—	—
22×60	—	—
24×40	—	—
24×50	—	—
24×60	—	—
25×50	—	—
25×60	—	—

NOTES

1 Permissible deviations for the width, length or diameter of cover slips shall be $\pm 1.00\ \text{mm}$.

2 Cover slips of other sizes may be supplied, if required by the purchaser.

IS 3099 (Part 1) : 1992

6 SAMPLING AND CRITERIA FOR CONFORMITY

The sampling plan for cover slips and their criteria for conformity with this standard shall be as given in Annex A of IS 3099 (Part 2) : 1992. The requirements to be inspected shall be those given in 2 to 5.

7 PACKAGING

Cover slips shall be packed in package of 10 g or multiples thereof so as to prevent damage during transit or storage due to surface abrasion or action likely to cause impairment of the transmitting surface. Packaging materials shall

be free from chemicals that may cause corrosion of the surfaces.

8 MARKING

The following information shall be marked on each carton of cover slips:

- a) Indication of the source of manufacture; and
- b) Dimensions of cover slips, that is, width and length (or diameter).

8.1 Standard Marking

Details available with Bureau of Indian Standards.

Indian Standard

MICROSCOPES — SLIPS AND SLIDES — SPECIFICATION

PART 2 MICROSCOPE SLIDES

(First Revision)

1 SCOPE

This standard (Part 2) covers the requirements of microscope slides and specifies the requirements for dimensions, thickness, optical properties and tolerances for microscope slides used for transmitted light microscopy in the visible spectral range.

2 MATERIAL

The material for microscope slides shall be transparent and colourless glass.

2.1 Optical Properties

Slides for microscopes shall have the following optical properties:

Refractive index n_e 1.53 ± 0.02

NOTE — The principal refractive index, n_e , is the refractive index of light at the green mercury e-line ($\lambda_e = 546.07 \text{ nm}$). This wavelength is close to the maximum sensitivity of the eye and has been used as the principal wavelength of optical computation for some time.

3 DIMENSIONS

The preferred dimensions for glass slides shall be as given in Table 1. By prior agreement, glass slides having dimensions other than those specified in this table may be supplied with reference to this standard, but the specified thickness should be maintained.

3.1 Thickness

Thickness of slides shall be any of the following as specified by the purchaser:

- a) 0.95 mm to 1.15 mm
- b) 1.15 mm to 1.35 mm
- c) 1.35 mm to 1.55 mm

NOTES

1 The permissible deviation for the thickness of slides shall be $\pm 0.015 \text{ mm}$.

2 These are general purpose slides mainly used for medical purposes. However thicker and thinner slides are available. Highest optical quality particularly with large aperture condensers, may not be obtained with these thicknesses. (This note is of cautionary nature and does not form part of this standard.)

4 VISIBLE SEED

The number of slides containing seed visible at $5 \times$ magnification shall not exceed two percent per package.

5 SURFACE FINISH

The surface of slides shall be free from pits, nicks, scratches and other surface irregularities when viewed at $5 \times$ magnification.

6 PARALLELISM

The working surfaces of slide shall be parallel to within five minutes of arc.

7 EDGE QUALITY

The edge of the slides shall be ground so that they are free from sharp edges and chips.

Table 1 Preferred Dimensions for Glass Slides
(Clause 3)

All dimensions in millimetres.		
Length <i>l</i>	Width <i>b</i>	Comments
45 — 1 ⁰	26 — 1 ⁰	Dimensions for standard slides
76 — 1 ⁰		
76 — 1 ⁰	39 — 1 ⁰	Dimensions for large slides
76 — 1 ⁰	52 — 1	

8 SAMPLING AND CRITERIA FOR CONFORMITY

The sampling plan for slides and their criteria for conformity with this standard shall be as given in Annex A. The requirements to be inspected shall be those given in 2 to 7.

9 PACKAGING

9.1 Slides shall be supplied in cartons of 50 pieces or of one hundred pieces. All the slides in a carton shall preferably be of same size.

9.2 Slides shall be packed so as to prevent damage during transit or storage due to surface abrasion or action likely to cause impairment of the transmitting surface. For the purpose slides shall be interleaved with suitable dust free paper. Packaging material shall be free

from chemicals that may cause corrosion of the surfaces.

10 MARKING

The following information shall be marked on each carton of glass slides:

- a) Indication of the source of manufacture;
- b) Material and description, such as glass slides for microscopes;
- c) Average number of slides contained in the carton; and
- d) Dimensions of slides, that is, width and length and thickness.

10.1 Standard Marking

Details available with the Bureau of Indian Standards.

ANNEX A
(Clause 8)

SAMPLING AND CRITERIA FOR CONFORMITY

A-1 SAMPLING

A-1.1 Lot

In any consignment all the cartons containing microscope cover slips (or slides) of the same type and size (namely, length, width and thickness) and manufactured by the same firm shall be grouped together to constitute a lot.

A-1.2 Sample cartons shall be selected at random from each lot in accordance with columns 1 and 2 of Table 2.

A-1.3 Two cover slips (or slides) shall be selected at random from each sample carton (see col 2 of Table 2) so that the total number of cover slips (or slides) in the sample form a lot shall be in accordance with col 4 of Table 2.

A-2 INSPECTION AND CRITERIA FOR CONFORMITY

A-2.1 Each cover slip (or slide) in the sample from a lot shall be examined for the specified requirements.

A-2.1.1 If the number of sample cover slips (or slides) failing to satisfy any one or more of these requirements is less than or equal to the permissible number of defectives given in col 5 of Table 2, the lot shall be declared as conforming to the requirements of these characteristics.

A-2.1.2 The lot shall be declared as conforming to the requirements of this specification if it satisfies the requirements given in A-2.1.1.

Table 2 Size of the Sample and Criteria for Conformity
(Clauses A-1.2, A-1.3 and A-2.1.1)

Number of Cartons			Number of Cover Slips (or Slides) in the Sample	Permissible Number of Defectives
In the Lot	In the Sample	In the Sub-Sample		
(1)	(2)	(3)	(4)	(5)
Up to 3	All	1	2n*	0
4 to 25	4	2	8	0
26 to 50	6	2	12	0
51 to 100	10	3	20	0
101 to 150	15	3	32	1
151 to 300	25	4	50	1
301 and above	40	5	80	2

*n is the number of cartons in the sample.

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Doc : No LM 20 (0026)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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